

What Is Claimed Is:

1. A process for the recovery of an organic acid from a fermentation broth comprising:

- 5 (a) drying said fermentation broth to obtain a dried product;
(b) adding said dried product (a) to a lower alcohol in the presence of an acid; and
(c) removing insolubles to obtain an organic acid.

2. The process of claim 1, further comprising removing the insolubles in said fermentation broth prior to the drying of step (a).

10 3. The process of claim 2, wherein said insolubles are removed by filtration.

4. The process of claim 3, wherein said insolubles are removed by ultrafiltration.

15 5. The process of claim 1, wherein at step (b) the concentration of said organic acid added to said lower alcohol is from about 50 g/L to about 100 g/L.

6. The process of claim 1, wherein at step (a) the process for drying comprises spray drying said fermentation broth.

20 7. The process of claim 1, wherein the reaction temperature at step (b) is from about 25° C to about 60° C.

8. The process of claim 1, wherein at step (b) said dried product is added to a lower alcohol prior to the addition of said acid.

9. The process of claim 1, wherein at step (b) about 1.2 equivalents of acid is added.

10. The process of claim 1, wherein at step (b) said lower alcohol is selected from the group consisting of methanol, ethanol, propanol, butanol and glycol.

11. The process of claim 1, wherein at step (b) said acid is selected from the group consisting of sulphuric acid, nitric acid, hydrobromic acid, hydrochloric acid and phosphoric acid.

12. The process of claim 11, wherein at step (b) said acid is sulphuric acid.

13. The process of claim 1, wherein at step (c) the process for removing insolubles comprises filtration.

14. The process of claim 1, wherein said organic acid comprises lactic acid, 2-keto-L-gulonic acid, citric acid or gluconic acid.

15. The process of claim 14, wherein said organic acid is 2-keto-L-gulonic acid.

16. The process of claim 1, further comprising esterifying said organic acid (c) to the corresponding ester.

17. A process for the recovery of an organic acid from a fermentation broth comprising:

(a) drying said fermentation broth to obtain a dried product;

(b) adding said dried product (a) to a lower alcohol to obtain an alcoholic suspension;

(c) adding an acid to said alcoholic suspension (b); and

(d) removing the insolubles to obtain an organic acid.

5 18. The process of claim 17, further comprising removing the insolubles in said fermentation broth prior to the drying of step (a).

19. The process of claim 18, wherein said insolubles are removed by filtration.

10 20. The process of claim 19, wherein said insolubles are removed by ultrafiltration.

21. The process of claim 17, wherein at step (b) the concentration of said organic acid added to said lower alcohol is from about 50 g/L to about 100 g/L.

15 22. The process of claim 17, wherein at step (a) the process for drying comprises spray drying said fermentation broth.

23. The process of claim 17, wherein the reaction temperature at steps (b) and (c) is from about 25° C to about 60° C.

20 24. The process of claim 17, wherein at step (b) said lower alcohol is selected from the group consisting of methanol, ethanol, propanol, butanol and glycol.

25. The process of claim 17, wherein at step (c) about 1.2 equivalents of acid is added.

26. The process of claim 17, wherein at step (c) said acid is selected from the group consisting of sulphuric acid, nitric acid, hydrobromic acid, hydrochloric acid and phosphoric acid.

27. The process of claim 26, wherein at step (c) said acid is sulphuric acid.

28. The process of claim 17, wherein at step (d) the process for removing insolubles comprises filtration.

29. The process of claim 17, wherein said organic acid comprises lactic acid, 2-keto-L-gulonic acid, citric acid or gluconic acid.

30. The process of claim 29, wherein said organic acid is 2-keto-L-gulonic acid.

31. The process of claim 17, further comprising esterifying said organic acid (d) to the corresponding ester.

32. A process for the recovery of an organic acid ester from a fermentation broth comprising:

(a) drying said fermentation broth to obtain a dried product;
(b) adding said dried product (a) to a lower alcohol in the presence of an acid;

(c) esterifying the free organic acid to the corresponding ester;
and

(d) removing insolubles to obtain an organic acid ester.

33. The process of claim 32, further comprising removing the insolubles in said fermentation broth prior to the drying of step (a).

34. The process of claim 33, wherein said insolubles are removed by filtration.

35. The process of claim 34, wherein said insolubles are removed by ultrafiltration.

5 36. The process of claim 32, wherein at step (b) the concentration of said organic acid added to said lower alcohol is from about 50 g/L to about 100 g/L.

37. The process of claim 32, wherein at step (a) the process for drying comprises spray drying said fermentation broth.

10 38. The process of claim 32, wherein the reaction temperature at steps (b) and (c) is from about 25° C to about 60° C.

39. The process of claim 32, wherein at step (b) said lower alcohol is selected from the group consisting of methanol, ethanol, propanol, butanol and glycol.

15 40. The process of claim 32, wherein at step (b) about 1.2 equivalents of acid is added.

41. The process of claim 32, wherein at step (b) said acid is selected from the group consisting of sulphuric acid, nitric acid, hydrobromic acid, hydrochloric acid and phosphoric acid.

20 42. The process of claim 41, wherein at step (b) said acid is sulphuric acid.

43. The process of claim 32, wherein at step (d) the process for removing insolubles comprises filtration.

44. The process of claim 32, wherein said organic acid comprises lactic acid, 2-keto-L-gulonic acid, citric acid or gluconic acid.

5 45. The process of claim 44, wherein said organic acid is 2-keto-L-gulonic acid.